



# A method of identifying health-based benchmarks for psychosocial risks at work: A tool for risk assessment



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## ARTICLE INFO

### Article history:

Received 15 February 2015

Received in revised form 18 November 2016

Accepted 18 November 2016

### Keywords:

Psychosocial risk assessment

Benchmark dose

Methods

Work stress

Critical exposure level

## ABSTRACT

**Objectives:** We present a novel approach to identify critical exposure levels or health-based benchmarks of job control using the benchmark dose (BMD) method. This method provides benchmarks for risk assessment of psychosocial risks, similar to benchmarks used for other occupational health hazards such as chemicals.

**Methods:** Two staged (bivariate and adjusted) BMD modelling was conducted using epidemiological data from an age-cohort study in south-eastern Australia. The adjusted BMD model incorporated age, gender, education, personality traits and mental health status at baseline.

**Results:** Depression is a more sensitive (health compromising) outcome for job control compared to anxiety in both types of BMD modelling. For an excess risk of 5% for depression, the adjusted benchmark dose was 0.49 and the critical exposure level, being the lower one sided 95% confidence limit of the adjusted BMD, was 0.37. If workplace guidelines are based on this critical exposure level, workers need to have a minimum of ten out of 15 aspects of job control measured in this study to reduce the excess risk of depression.

**Conclusions:** The BMD approach can identify critical exposure levels for job control. This suggests a similar approach can be used for other psychosocial risks for which no critical exposure levels are currently available. Critical exposure levels can provide guidance needed to assess risk and address psychosocial risks, similar to other health hazards. Benchmarks or critical exposure levels of psychosocial risks can assist the inspectorate and employers to conduct risk assessment of workplaces and identify areas for intervention.

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## 1. Introduction

Psychosocial risks which can arise from the organisation and design of work are associated chronic health conditions in workers including depression, anxiety, cardiovascular disease and musculoskeletal disorder in both affluent and transitional economies (Backé et al., 2012; Clumeck et al., 2009; Stansfeld and Candy, 2006; Sultan-Taïeb et al., 2011). In Australia, workers' compensation claims for psychosocial risks are among the most common and the most costly type of occupational disease claims (Safe Work Australia, 2012, 2013). A 2010 survey of occupational health

and safety (OHS) experts from twenty developing countries including Namibia, Chile, India and China identified work design hazards as the second highest priority for OHS in developing countries after accident prevention (Kortum et al., 2010).

Different theoretical models of psychosocial risks and its effects exist and one of the most well-known is Karasek's demand-control model (Karasek, 1979; Stansfeld and Candy, 2006). The demand-control model identifies two psychosocial risks: high job demands and low job control. Job control is control over the type and timing of work tasks and skill discretion that enables a worker to decide which skill to use and how to organise and complete their tasks. This is especially important in coping with job demands which include heavy workloads, fast pace of work, and deadlines.

Common mental disorders such as depression and anxiety are the outcomes with the most epidemiological evidence available in relation to low job control (Clumeck et al., 2009; Stansfeld and Candy, 2006; Stansfeld et al., 2008). These associations appear to

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be universal. A study of Thai workers shows that job-related risk factors linked to time pressure and a lack of decision making authority (termed job control) were associated with psychological distress even after adjusting for baseline mental distress and exposure to physical hazards (Yiengprugsawan et al., 2015). Longitudinal studies in Japan, France, UK, Australia and Taiwan also show that low job control significantly predict depression and anxiety in workers after controlling for potential confounders (Butterworth et al., 2012; Huang et al., 2012; Inoue et al., 2010; Niedhammer et al., 1998; Stansfeld et al., 2008; Strazdins et al., 2011).

Despite the strong empirical evidence, there is the perception that psychosocial risks such as job control are too complex and difficult to manage, and that they are rarely systematically assessed or managed in the workplace (Iavicoli et al., 2011). In the first EU wide survey of businesses on psychosocial risks in 2009, only half of the businesses reported that they had informed their employees about psychosocial risks and 42% considered it more difficult to tackle psychosocial risks compared to other health and safety hazards (European Agency for Safety and Health at Work, 2010). The most common reasons for this perceived difficulty were the lack of awareness and lack of resources. A second survey in 2014 showed that employers still had difficulty in addressing psychosocial risks with a common reason being a lack of adequate tools to deal with the risk effectively (European Agency for Safety and Health at Work, 2015).

There is also continued resistance to addressing psychosocial risks in the workplace by some workplace stakeholders and conflicting views among various stakeholders about responsibility (Gordon et al., 2009; Leka et al., 2015). The very nature of psychosocial risks arising from the organisation of work means that improving the psychosocial work environment will require changes in how employers manage and run their workplaces. Addressing psychosocial risk factors for poor mental health also poses additional challenges due to the complexity in measurement and assessment of causality for mental disorders.

Part of the challenge in addressing psychosocial risks is the way these risks are legislated and the type of information currently available to assist employers. In Australia, a federation with nine main OHS legislations (federal and eight states and territories), general duty requirements in occupational health and safety legislations cover psychosocial risks, where health is defined to include psychological health in most jurisdictions. However, as psychosocial risks are not explicitly defined, employers are required to recognise the range of psychosocial risks that can harm workers' health and to be aware that their duty to provide a healthy and safe environment to workers extends to psychosocial risks in the workplace. While a number of codes of practice, guidance materials and factsheets are produced by various Australian OHS regulators and nationally by Safe Work Australia to help address psychosocial risks, none include specific benchmarks or exposure levels to guide employers to determine when action or intervention is required in their workplace to protect workers' mental health.

This difficulty in determining a safe and healthy psychosocial work environment is an issue not just limited to employers but also for OHS inspectors who risk assess, monitor and enforce health and safety laws. In a study of OHS inspectors in Australia, only 5% of issues identified during workplace visits related to psychosocial risks, with the majority of inspections concentrating on 'traditional' occupational hazards such as machine guarding and noise (Johnstone et al., 2011). Even when psychosocial risks were addressed, they were largely limited to the more tangible issues such as bullying and harassment complaints rather than the underlying psychosocial risks arising from the organisation of work such as job control and job demands at work. This is partly because OHS inspectors are used to focusing on physical hazards such as

machine guarding, noise and hazardous chemicals which can be inspected using a check-list, a walkthrough of the workplace or by undertaking noise and airborne measurements in the workplace. In contrast, psychosocial risks are typically not visible and unlike noise and chemicals, there is no voluntary or mandatory guidance on which levels of exposure to psychosocial risks are acceptable. This makes the determination of what constitutes a safe psychosocial work environment difficult and specialist knowledge and expertise is required to do so.

OHS inspectors in other countries also face similar issues and have developed and trialled new methods for inspection of psychosocial risks (Ertel et al., 2010). Bruhn and Frick (2011) highlighted the challenges faced in Sweden when developing specific methods and tools for psychosocial risks that can be used by inspectors without special training or background in psychosocial risks. Despite development of new methods and tools, Bruhn and Frick concluded that in practice, these tools provided little guidance, especially for non-specialist inspectors without a background in psychological or social sciences. In Denmark, the Danish Working Environment Authority (DWEA) has developed industry sector specific guidance tools and trained the labour inspectors in how to use these guidance tools to assess and evaluate psychosocial risks (Rasmussen et al., 2011). However, the use of the tools was considered challenging for inspectors lacking a background in psychology and inspectors were still required to make an individual evaluation of whether a workplace's psychosocial work environment requires improvement and make judgements in relations to health risks.

Limited knowledge on how to assess psychosocial risks and general regulations lacking in clarity were also identified as barriers to reducing exposure to psychosocial risks in other European studies (Graversgaard, 2004; Iavicoli et al., 2011; Leka et al., 2011). An investigation of labour inspection strategies in European Union Member States for emerging risks such as psychosocial risks found that the lack of visibility of psychosocial risks, the multi-causal nature of mental disorders and the reluctance by individuals to report issues associated with psychosocial risks further add to this challenge (Cardiff University, 2011). The authors concluded that support for risk assessment and risk management of psychosocial risks is needed to improve labour inspection responses (Cardiff University, 2011).

In recent years, there have been many advances to improve risk assessment and risk management of psychosocial risks. Examples include the UK Health and Safety Executive (HSE) Management Standards and the indicator tool, the European Psychosocial Risk Management Framework (PRIMA-EF), a standard for psychosocial risk management (PAS 1010) which provides guidance on managing psychosocial risks systematically (British Standards Institution, 2011; Cousins et al., 2004; Leka et al., 2008) and a voluntary Canadian standard for psychological health and safety in the workplace (Canadian Standards Association, 2013). Recognising the variation and difficulties in undertaking inspection of psychosocial risks at work, the International Labour Organisation is also developing guidelines for labour inspection of psychosocial risks to provide global guidance on this issue but the tool is not yet publically available (Velaquez, 2015).

Risk assessment tools such as the HSE's indicator tool enable a workplace to undertake risk assessment that identifies hazards and to assess risk of potential harm associated with exposure to these hazards. Risk assessment tools for psychosocial risks are typically surveys and can be used by health and safety inspectors during workplace inspections and by managers and employers to conduct risk assessment in their organisations. For example, in Denmark, the Copenhagen psychosocial questionnaire is used by Danish companies using the national average from a population study (Kristensen et al., 2002) as a benchmark (Pejtersen et al., 2010). However, the HSE and Danish benchmarks are based on

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